ELECTRICAL SPECIFICATIONS

CODES AND STANDARDS
The electrical installation shall comply with the following codes and standards:
1.Underwriter"s Laboratories inc - U.L.
2.National Electrical Code of the NFPA - NEC
3.New York, N.Y. Electric Code
4.Occupational Safety and Health Act- OSHA

SHOP DRAWINGS AND CATALOG CUTS
The Contractor shall prepare and submit to the Engineer for approval, detailed shop drawings,catalog cuts and wiring diagrams in accordance with the requirements of the clause entitled "Working drawings and Catalog Cuts and Brochures."

SUBSTITUTIONS
Any substitution to the electrical items described on this contract will only be permitted upon written approval of the Engineer

QUALITY ASSURANCE
The Contractor shall have had experience on at least two projects involving quantities and complexities at least equal to those required under the electrical portion of this contract. All workmen shall be skilled in the trade involved

INSPECTION
All stages of the installation shall be inspected for compliance with the requirements of the contract drawings and specifications. Replace any portion of the construction that does not meet such requirements, to the satisfaction of the Engineer.

CUTTING AND PATCHING
1.All cutting and patching required for equipment included in these specifications shall be done by this Contractor. If cutting is done due to failure to perform preliminary roughing work, this Contractor will be responsible for the cost of the additional patching.
2.In those portions of the building where new floors, or walls, or partitions are required to be constructed, the Contractor shall furnish and locate all required sleeves and inserts before the floors, or walls, or partitions are constructed. Where sleeves and inserts were not installed, or were incorrectly located, the Contractor shall be responsible for the cost of any required cutting and patching.
3.All floor drilling above or adjoining occupied tenant spaces or public spaces shall be performed at times approved by the Engineer.
4.This Contractor shall not do any cutting that may impair the strength of the building construction. No holes, except for small screws, may be drilled in beams or other structural members, without obtaining prior approval. All work shall be done in a neat manner by mechanics skilled in their trades and as approved.

DISSIMILAR METALS
1.Dissimilar metals as used herein shall be those which are incompatable in the presence of moisture, as determined from their position in the electrochemical series or from test data. Where dissimilar metals come in contact, paint the joint both inside and out with approved paint so as to exclude moisture from the joint, or provide a suitable barrier separating the metals.
2.Transitions in conduit from one metal to a dissimilar metal shall only be made at boxes or other enclosures, except where otherwise specified herein or shown on the contract drawings.

RACEWAYS AND BOXES
1.Where sizes of raceways or boxes are not indicated, the Contractor shall size these items as required for the installation.
2.Flexible metal conduit shall be used for the final connection of lighting fixtures and wiring devices to be installed in hung ceilings or in removable hollow metal partition construction. When designated by the Engineer on final approved drawings, flexible metal conduit shall be used for final connection of lighting fixtures and wiring devices to be installed in movable walls or movable partitions. Flexible metal conduit shall be used in such designated movable walls and movable partitions at no additional cost to the owner.
3.All conduit and tubing shall be cut square and reamed at the ends. Red lead shall be applied to all exposed threads after joints have been made clean and tight.
4.Conduit and tubing runs shall be mechanically and electrically continuous from service starting to all outlets. Conduit shall enter and be securely connected to cabinet, junction box, pull box or outlet box by means of locknuts on the outside and inside and an insulated bushing on the inside. In tubing or flexible metal conduit, the one compression locknut shall be made wrench tight. All locknuts shall be the bonding type with sharp edges for digging into the metal wall of the enclosure and shall be installed in a manner that will assure a locking and electrically continuous installation.Locknuts and bushings will not be required where conduits are screwed into tapped connections.
5.All vertical runs of conduit or tubing terminating in the bottoms of wall boxes or cabinets, or similar locations, shall be protected from the entrance of foreign material prior to the installation of conductors.
6.Unless otherwise specified, all conduit and tubing shall be installed concealed. In general, all conduit and tubing shall be run in hung ceilings and furred spaces where they exist. Where conduit is run exposed it shall be securely supported with zinc coated malleable iron pipe straps or other approved metals.
7.Every conduit system shall be installed complete before any conductors are drawn in. Wire pulling lubricants, when utilized, shall be in accordance with the requirements of Underwriters Laboratories Inc. applicable to the specific conductor or cable insulation and raceway material.
8.Where required, and approved by the Engineer, extra deep or extra shallow outlet boxes shall be used to facilitate the installation of the conduit system

OUTLET DEVICES
1.All device plates for wall outlets (Power and Telephone) shall be brushed satin finish anodized aluminum. Device plates for telephone outlets shall contain a bushed hole.
2.All convenience type receptacles shall be of the grounding type.

GROUNDING
1.Metal raceways, metal enclosures of electrical devices and equipment, lighting standards and other equipment shall be completely grounded in an approved manner
2.Proper hardware required for complete grounding system, shall be installed by the Contractor

FASTENERS
Provide inserts, expansion shield lugs, anchors, bolts with nuts and washers, shims or any other type of fastening devices required to fasten panels or other equipment to foundations, floors, walls or ceiling. Unless otherwise specified herein or shown on the contract drawings, all fasteners shall be hot-dipped galvanized and of sizes and types *recommended by the equipment manufacturer and as approved by the* Engineer

WIRES
1.Unless otherwise specified or specifically indicated on the drawings, all conductors for lighting and power shall be tinned single conductor annealed copper with type XHHW insulation, 600 volt and a minimum of 98 percent conductivity.
2.In lieu of a separate green grounding wire and grounding bushings, flexible metalic raceway for connection of lighting fixtures may be utilized as the grounding conductor if a locking type construction shakeproof connector especially designed to insure positive grounding is provided.

Color coding
The Contractor shall match the color coding that is being used in the building-any deviation due to limited quantities of cable may be permitted upon written approval of the Engineer.

	System Voltage	
120/208V	Phase	277/480V
Black	A	Brown
Red	B	Orange
Blue	C	Yellow
White	Neutral	Gray
Green	Ground	Green

Connections
The wiring for lighting, receptacles including outlets for miscellanious devices and for electric power, including all 120/208V connections into the cellular floor systems shown on the drawings, shall be furnished and installed complete from point of service connection to all outlets indicated on drawings.

CABLE SPLICING
1.No splices or joints will be permitted in either feeders or branches except at outlets or accessible terminals, splice or junction boxes.
2.All materials required for making splices and/or terminations shall be supplied in complete kits- not older than 6 months- the Contractor shall also be responsible to insure that all materials furnished will not adversely effect the physical or electrical properties of any other, or of the wire or cable itself. Kits shall be manufactured by Mac Prod. Inc, Kearny, N.J. or approved equal.
3.Where the Contractor makes connections to existing wires, he shall open and disconnect the existing splices from such wires and install new splices to include the existing as indicated.
4.All splices for wire sizes #10 and smaller shall be made with insulated spring connectors applied to twisted conductors. Two half lapped layers of vinyl tape extending a distance of not less than one inch from the connector shall be applied. Splices other than the aforementioned, will be permitted at the discretion of the Engineer.

Lighting Fixture Hookup Wire
1. Splices shall not be permitted in any run of fixture hookup wire.
2. Connections to branch circuit conductors and to existing fixture wiring shall be made by insulated spring connectors or crimp type connectors.

IDENTIFICATION OF WIRES
1.All wires shall be identified by circuits in all cabinets, boxes, wiring troughs and other enclosures, and at all terminal points, i.e., receptacles, etc.
2.The circuit designations shall be as shown on the contract drawings, or as directed by the Engineer. Tags shall be attached to wires so that they will be readily visible.
3.Brady B-500 vinyl cloth wire and terminal markers shall be used for all wire identification.

LIGHTING FIXTURES
General
1. This clause of the Specification covers the furnishing materials, equipment and the installation of all indo fixtures, lighting equipment and the installation of l electrical outlets in the building, including the conn fixtures and equipment to the electric wiring system plans. As specified hereinafter, fixtures shall be fur this Contractor for installation and connection by th
2. The Contractor is directed to review the applicable Electrical drawings for details on fixture constructi installation media for fixtures. The drawings re es a final design, and reasonable changes to design may
3. All luminaires and lighting equipment shall be deliv premises complete, including all mounting accessor components necessary for the proper operation of th
4. All fixtures and components shall be made in accord National Electrical Code, all local codes applying an all applicable requirements of the Underwriter's La

LAMPS
Lamps shall be those manufactured by General Electric Sylvania. All flourescent lamps shall be warm white w applicable. Incandescent lamps shall be rated at 115 otherwise noted
The Contractor shall install new lamps in all new fixtu can supply flourescent lamps for base building type fix lamps shall be furnished by the Contractor. "Supplied by *be purchased from.*
Prior to acceptance and final payment, all lamps which a burnt-out or broken shall be furnished or replaced by the

Installation and locating of fixtures
Fixture locations as indicated on the electrical drawings and approximate. The Contractor shall carefully verify f with Architectural plans, reflected ceiling plans and oth prior to installation.

Wiring
1. Wiring between flourescent lampholders and associa starting equipment shall be of the same or heavier g furnished with the approved types of ballasts and sh better insulating and heat-resisting characteristics. within flourescent lighting fixtures or from the fixt with the building wiring shall conform to the require latest published issue of the National Electrical Cod
2. Unless otherwise specified or shown on drawings, al conjuction with incandescent fixtures shall conform requirements of the latest issue of the National Elec shall be not less than No. 16 Gauge. Wiring shall be p or tubing at all points where abrasion is likely to oc concealed within fixture construction, except where or mounting dictates otherwise.
3. Connections of wires to terminals of lampholders an shall be made in a neat and workmanlike manner and electrically and mechanically secure with no loose s The number of wires extending to or from the termi or other accessory shall not exceed the number whic designed to accommodate.
4. Joints in wiring within lighting fixtures and connec wiring to the wiring of the building shall be so splic be mechanically and electrically secure and then so provide insulation equal to that of the conductors b of solder and tape, approved types of adequately ins pressure crimped type connectors may be furnished used, method of application and tools employed are the connector manufacturer's recommendations.
5. Wiring channels and wireways shall be free from pr and sharp edges throughout, and all points or edges conductors must pass and may be subject to injury rounded or bushed. Insulated bushings shall be inst of entrance or exit of flexible wiring.

Flourescent Lamp Ballasts
1. Ballasts shall provide and assure safe and reliable particular flourescent lamp(s) specified for each fixtu shall be of high power factor type series or maxi-mise applicable-sequence for operation of Rapid Start Lamp
2. The ballast shall be protected by a minimum of a starting from the date of acceptance of the installed f defects in workmanship and material which includes a service program providing for the payment of authoriz incurred in the replacement of inoperative in-warrant

SUPPORTS
1.Recessed fixtures shall be furnished complete with accessories. Where necessary to meet code requiremen *housings shall be suitable for a 1 hour fire rating or c* requirements. Attachment devices including brackets, hangers, and tie bars shall be made of formed or rolle the requisite rigidity and strength to maintain continu installed fixtures.
2.Fixtures shall be attached to ceiling supporting mem

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